Use of CoAsT for Small Water Systems ©

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CoAsT Objectives

- Integrate arsenic tools
- Web-based: http://wercstation.nmsu.edu:8080/arsenic/AsTree.dsb
- User-friendly, readily available and free
- Geared to small communities, decision makers and design engineers
- Tailored to the user's needs

GOAL: Provide help selecting the right tools for the job!

CoAsT Integration

- What is the optimal technology?
  - Decision Tree
- How much does it cost and how does it compare against other technologies?
  - Cost models
- How do we pay for it?
  - Rate setting program
- Where do we get additional information
  - Living documentation

Living Document

Living Document Content

- Arsenic Water Technology Partnership
- Federal, State(s) Regulations
- Health Effects
- Arsenic Chemistry
- References
- Appropriate Links

Decision Trees (Based on EPA Criteria found in EPA 816-R-03-014)

Content in Decision Trees

- Tree 1
  - Non-Treatment and Treatment Minimization
- Tree 2
  - Pre-Oxidation
  - Existing Treatment Enhancements
- Tree 3
  - New Treatment Technologies

Tree 1- Non-Treatment and Treatment Minimization

- Alternate Source
- Seasonal Use
  - Seasonal Back-up Use Calculator (based on concentrations)
- Blending
  - Water Blending Calculator (based on flows and concentrations)
- Side Stream Treatment
  - Specialized Version of Blending

Tree 2 – Pre-Oxidation, Using Existing Treatment

- Pre-Oxidation Processes
  - Chlorine
  - Permanganate
  - Ozone
  - Solid Phase Oxidants
- Enhancing Existing Treatment Technologies
  - Tree 2a – Coagulation/Filtration
  - Tree 2b – Lime Softening
  - Tree 2c – Iron and Manganese Filtration

Tree 3 – New Treatment Technologies

- Source Water Chemistry
- Tree 3a – Ion Exchange Processes
- Tree 3b – Sorption Processes
- Tree 3c – Filtration and Membrane Processes
- Centralized vs. POU/POE

Cost Models

Cost Models Available in CoAsT

- AwwaRF
- ARCE
- POU
- Other technologies (under development)

AwwaRF Model Background

- Developed by Malcolm Pirnie, Inc. and University of Colorado for AwwaRF
- Adsorption media and Activated Alumina
- 10<Q<3,500 gpm (0.014<Q<5.04 MGD)
- Available to AwwaRF subscribers only

ARCE Model Background

- Developed by Battelle NL for EPA NRMRL/ORD
- Adsorption Media, Activated Alumina and Ion Exchange
- 0.7<Q<347 gpm (0.001<Q<0.50 MGD)

O&M Cost Highlights

- Predictive based on water chemistry (AwwaRF)
- Empirical: based on field studies (AwwaRF, ARCE)
  - Pilot, or
  - RSSCT, or
  - Manufacturer

q =x/m or BV

Capital Costs Highlights

- AwwaRF uses polynomial equation to compute capital cost line items:
  - Cost = $a + bQ + cQ^2 + dQ^3 + eQ^f$
- ARCE estimates capital cost of each individual component (pumps, tanks, piping, etc.)

Establishing a Solid Financial Structure

Rate Setting Structure

- Program based on the Rural Community Assistance Corporation (RCAC) procedures
- Proven spreadsheet that presently requires RCAC personnel assistance

CoAsT Objective

- Convert spreadsheet to web-based, user-friendly tool
- Allow small communities to set their own rate structures to meet capital and operational expenses obtained through cost models

Q and A

- **Web link**

http://wercstation.nmsu.edu:8080/arsenic/AsTree.dsb

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